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Analysis of Factors Related to Body Mass Index among Government Matriculation and Government Aided School Boys

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Abstract

The present study was to find out the analysis of factors related to body mass index among Government, Matriculation and Government Aided School Children. Hundred male students those who are studying 8th standard, were randomly selected as subjects. Data collected from the Government (GOA); Government Aided (GAD) and Matriculation (MAD) Schools on height, weight, Body mass index (derived from height and weight), body fat percentage (derived from four Skinfold measurement: triceps, Subscapular, Supraspinale & Medial Calf), Descriptive statistics were computed. The correlation coefficient (r) was applied to determine if there were positive or negative relationships between the body mass index and body fat percentage under study. One way Analysis of Variance (ANOVA) were computed to examined the significant difference in means of the GOA, GAD and MAD on all the criterion variables. the result revealed that that the prevalence of overweight and obesity was high among the Government Aided and Matriculation school boys.

Keywords: Derived Variables, Anthropometric Characteristics, School Children.

Introduction

Obesity is a worldwide health hazard. Millions of people of every age are carrying excessive weight on their bodies. Obesity is a condition that arises, when the body weight exceeds the requisite normal weight. Accumulation of fat deposits in the body tissues results in obesity the most useful measure of obesity is the body mass index (BMI). BMI is based on height and weight and is used for adults, children, and teens (Locke and Kahali, 2015). The assessment of obesity does not depend solely on the measurement of an individual's total body mass but also on body composition and fat distribution. Body composition can be measured by various techniques, including highly sophisticated and accurate methods like densitometry, plethysmography, nuclear magnetic resonance and Dual-energy X-Ray Absorptiometry (DXA). However, these methods are complex and expensive, and their use in clinical practice and large epidemiological studies is limited (Horie, et al., 2008). Measurements of body mass index (BMI), waist circumference (WC) and waist-hip ratio (WHR), and body composition assessments using skin fold thickness (ST) and bioelectrical impedance analysis (BIA) have been widely used due to their convenience and relatively low cost (Rezende, et al., 2007). BMI [BMI = weight (kg)/height $(m)^2$] has been the most widely used index for assessing weight status due to its simplicity, ease of application, reduced demand for training and reliance on less expensive equipment. Using less expensive equipment procedures, the purpose of the present study was to find out the analysis of factors related to body mass index among Government, Matriculation and Government Aided School Children.

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Methodology

Body Mass Index (BMI) is an accurate reflection of body fat percentage in the majority of the adult population. A formula combining height and weight can be used to estimate a person's body mass index. To achieve the purpose, hundred male students from Arulmigu Senthil Andavar boys Government Higher Secondary school Tiruchendur, Bishop Azariah Memorial Higher Secondary School, Vellalanvilai and Anitha Kumaran Matriculation higher secondary school, Thandupatthu, those who are studying 8th standard, were randomly selected as subjects. Totally three hundred students were selected as subjects during the year 2015 – 2016 from Government (GOV); Matriculation (MAT) and Government Aided (GAD) School, belongs to Thoothukudi District, Tamilnadu. Their age were ranged from 13-14 years. Proper informed context from Head of the Institution, Parent and participants were obtained before conducting the research. The variables selected for this study were presented in the table 1.

Table 1
Variables and Test Items

S. No	Variables	Test Items	Unit of Measurement
1	Height (Body Stature)	Stadiometer	Meter
2	Weight (Body mass)	Weighing Machine	Kilograms
3	Body Mass Index	Weight/Height^2	Kg/Mts^2
4	Body Fat Percentage	Harpenden's skin fold caliper *	Mm

* (Triceps, Subscapular, Supraspinale & Medial Calf)

The experimental design used for this study was simple random group design and the subjects were randomly selected from each of the three schools, belongs to Thoothukudi district during the year 2015 – 2016. Data collected from the Government (GOA); Government Aided (GAD) and Matriculation (MAD) Schools on height, weight, Body mass index (derived from height and weight), body fat percentage (derived from four Skinfold measurement: triceps, Subscapular, Supraspinale & Medial Calf), Descriptive statistics were computed. The correlation coefficient (r) was applied to determine if there were positive or negative relationships between the body mass index and body fat percentage under study. One way Analysis of Variance (ANOVA) were computed to examined the significant difference in means of the GOA, GAD and MAD on all the criterion variables. Scheffe's Post hoc test were done on those variables in which F-ratio's were found to be significant, in order to find which pair of means were greater among the other. The level of significance for making inferences was set at 0.05.

Results and Discussion

From the table – II, the mean and standard deviation; minimum and maximum on height, weight, body mass index and body fat percentage of Government (GOV), Government Aided (GAD) and Matriculation (MAT) school boys were presented. Except height, weight, body mass index and body fat percentage have the mean differences observed in which body weight plays a predominant role in determining the body composition of the GOV; GAD and MAT school boys. Since height of GOV, GAD and MAT (1.55, ± .08; 1.58, ± .08 and 1.58, ± .09) are almost very close to one another, where weight of GOV; GAD and MAT school boys (55.04, ± 8.53; 67.84, ± 15.92 and 72.03, ± 15.11) are differed with greater dispersion respectively.

Table 2
Descriptive Statistics of Height, Weight, BMI and BF % among Government (GOV), Government Aided (GAD) and Matriculation (MAT) school boys

Dependent Variable	Groups	Mean	Std. Dev **(±)**	Minimum	Maximum
Height	GOV	1.55	.08	1.40	1.70
	GAD	1.58	.08	1.43	1.72
	MAT	1.58	.09	1.41	1.72
Weight	GOV	55.04	8.53	40.43	71.69
	GAD	67.84	15.92	40.93	99.74
	MAT	72.03	15.11	47.15	99.90
Body Mass Index	GOV	23.07	4.45	14.79	32.98
	GAD	27.35	6.50	14.48	39.29
	MAT	29.12	6.52	17.72	45.21
Body Fat Percentage	GOV	18.12	4.91	9.54	27.15
	GAD	21.29	5.379	10.80	27.28
	MAT	22.91	5.07	12.05	29.07

(N = 300: n = 100)

Table 3
Correlation Matrix of Under Weight, Normal, Over Weight and Obese School Boys among Government (GOV), Government Aided (GAD) and Matriculation (MAT) schools

Variables	Body Mass Index	Body Fat Percentage	Height	Weight
Body Mass Index	1	.959**	-.291**	.894**
Body Fat Percentage		1	-.297**	.860**
Height			1	.157**
Weight				1

*** Correlation is significant at the 0.01 level (2-tailed).*

From the table 3, there was a high positive correlation (0.96)exists among the Body Fat Percentage and Body Mass Index at 0.01 level of significant, which both are directly proportional to each other. Further, the derived Variable, body mass index from height and weight, weight was accounted significant high positive correlation (0.89) whereas height was very low negatively correlated (-0.29) with body mass index, but significant at 0.01 level. and on the body fat percentage, weight had high significant positive correlation (0.86) at 0.01 level.

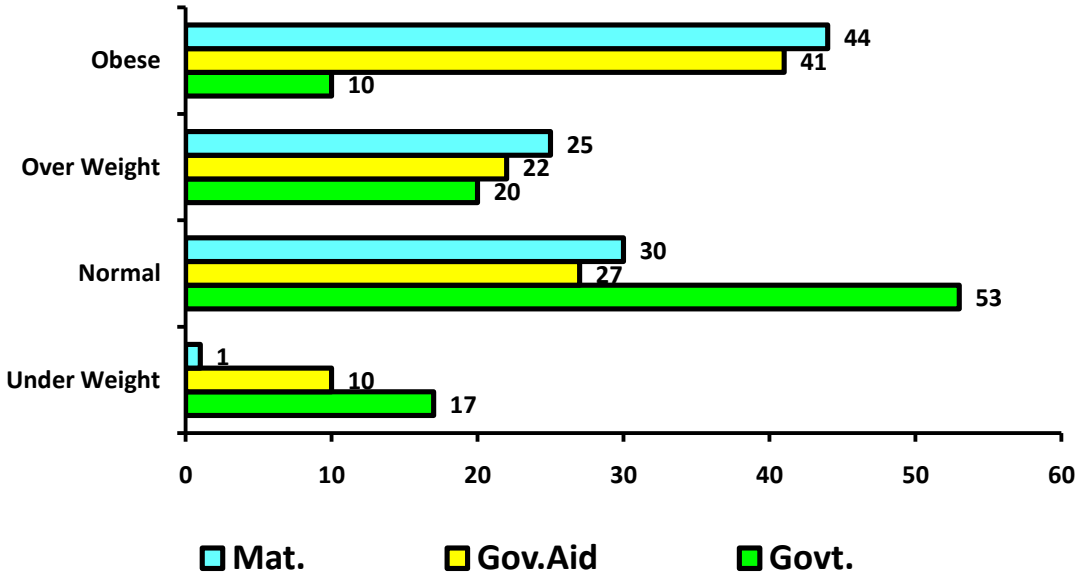

Table 4
Analysis of Variance among the Government (GOV), Government Aided (GAD) and Matriculation (MAT) schools Boys on Height, Weight, Body Mass Index and Body Fat Percentage

Dependent Variable	Source	Sum of Squares	df	Mean Square	F
Height	Between Groups	0.045	2	.022	3.203*
	Within Groups	2.083	297	.007	
Weight	Between Groups	15673.503	2	7836.752	42.391*
	Within Groups	54905.889	297	184.868	
Body Mass Index	Between Groups	1940.163	2	970.082	27.82*
	Within Groups	10355.337	297	34.866	
Body Fat Percentage	Between Groups	1188.397	2	594.198	22.62*
	Within Groups	7800.801	297	26.265	

***** $p < 0.05$ Table F, df (2, 297) (0.05) = 3.026*

In table 4, the results of one-way analysis of variance on height, weight, body mass index and body fat percentage among the three groups namely Government, Government Aided and Matriculation school boys were presented. From the table it can be seen that the calculated F value of all the selected variables 3.20; 42.39; 27.82 & 22.62 among the three groups was greater than the table value of 3.03 indicating that it was significant ($p<0.05$) for the degrees of freedom (2, 297) at 0.05 level of confidence. Since the F value was significant, the Scheffe's Post-hoc test was further computed to find out which pair of group is high among the others and the results are tabulated in the table 5.

In table 5, the Scheffe's Post-hoc test results are presented. From the table it can be seen that the mean difference between GOV & GAD as well as GOV & MAT on height, weight, body mass index and body fat percentage were 0.03; 0.03; 12.8; 16.99; 4.28; 3.05; 3.17 and 4.79, ($p < 0.05$) respectively, greater than the confidential interval value 0.03 for height; 4.73 for weight; 2.05 for BMI & 1.78 for BF % respectively which was significant at 0.05 level of confidence. But among the mean difference between GAD and MAT had no significant difference exists on all the variables. A total of 300 school boys participated in this study. They comprised three schools, based on Government, Government Aided and Matriculation schools belongs to Thoothukudi District. The ratio of students sample in the school type was 1: 300 (GOV, GAD & MAT each), whereas the whole population's BMI ratio is 28:110:67:95 (under weight: normal: over weight: obese). The mean values and SDs for body weight and height, BMI, BF % are shown in table II. There is a gradual increase in body weight, height, BMI and BF % in except at the GAD and MAT height.

Table 5
Scheffe's Post-hoc test for Mean differences between the Government (GOV), Government Aided (GAD) and Matriculation (MAT) schools Boys on Height, Weight, Body Mass Index and Body Fat Percentage

Variables	GOV	GAD	MAT	Mean Difference	CI
Height	1.55	1.58		0.03*	0.03
		1.58	1.58	0	
	1.55		1.58	0.03*	
Weight	55.04	67.84		12.8*	4.73
		67.84	72.03	4.19	
	55.04		72.03	16.99*	
Body Mass Index	23.07	27.35		4.28*	2.05
		27.35	29.12	1.77	
	23.07		26.12	3.05*	
Body Fat %	18.12	21.29		3.17*	1.78
		21.29	22.91	1.62	
	18.12		22.91	4.79*	

Figure I present the frequency distribution of BMI classification of three school boys in which most of the obese boys were reported from GAD and MAT (31.67 %) whereas most of the normal classification were accounted from GOV (36.67 %). Further, there was significant relationship exist among the body fat

percentage with body mass index, in which weight contributing BMI than the height. There was a significant mean difference were reported among the three school boys on all the selected criterion measures. Also post hoc test revealed that GOV and MAT was the best pair of mean difference accounted among the other pair of groups on all the parameters. The present study showed that the prevalence of overweight and obesity was high among boys of Thoothukudi area. This study has shown higher figures which is suggestive of the obesity epidemic in 21st century. The reason for higher prevalence of obesity among boy's due to selection of the subjects from very affluent societies and few schools. Now a day, the modern food environments provide a wide range of opportunities to consume food and drink products leading to what is called passive consumption. To summarize, the results that all the differential hypotheses of the present study have been empirically verified and turned out to be significant at acceptable level of confidence.

Conclusions

On the basis of the result of the study, the following conclusions were drawn,

1) The present study revealed that the prevalence of overweight and obesity was high among the Government Aided and Matriculation school boys of Thoothukudi area.
2) Significant determining factor for overweight and obesity among the school going boys was Weight and it has highly associated with body fat percentage.
3) Body mass index and body fat percentage has positively correlated and are directly propositional to each other.

References

1. Locke AE, and Kahali B. (2015), "Genetic studies of body mass index yield new insights for obesity biology", *Nature*, PP.197 -206.
2. Rezende F, Rosado L, Franceschinni S, Rosado G, Ribeiro R, Sheeyan M, et al. (2007) Critical revision of the available methods for evaluate the body composition in population-based and clinical studies. Arch Latinoam Nutr 57: 327-334.